FLDGRF

THE NWS FLDWAV GRAPHICS PROGRAM
(Unix Version)

USERS GUIDE

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by

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PROGRAM DESCRIPTION

The NWS FLDGRF program is a interactive, menu-driven, application which was developed to display the output data generated by the NWS FLDWAV model. The Unix version may be used both with the stand-alone FLDWAV model (compiled in Unix environment) and in conjunction with the NWSRFS operational program (FCST, IFP). It may also be used with the NWSRFS MCP3 program in a limited capacity. Since the MCP3 program cycles through the FLDWAV model on a monthly basis, only the last month of data can be displayed using FLDGRF.

The FLDWAV model generates 17 files which contain the hydraulic information for the data set being run. The name of the segment is merged with each extension described in Table 1. If no segment exists, the name "dummy" will be used as the file name. All of these files are binary files except the ".ttl" file which is an ASCII file. The ".ttl" file contains a description of the problem, the names of rivers, and information needed by FLDGRF to access the other files. This file may be edited to change the descriptive lines only (i.e., river names and problem description). The FLDGRF program will generate the following four ".txt" files in the directory from which fldgrf is run:

*segid*obs.txt
alldata.txt
bunches.txt
dummyobs.txt

where *segid* is the name of the segment ("dummy" if no segment exists). These files contain the contents of the fldgrf files listed in Table 1 and are used for system level debug purposes only.

TABLE 1. FLDGRF Files Generated by FLDWAV

EXTension	Description
.bs	Active top widths (channel) for each actual cross section.
.bsl	Active top widths (left flood plain) for each actual cross section.
.bsr	Active top widths (right flood plain) for each actual cross section.
.bss	Inactive top widths for each actual cross section.
.ds	Downstream boundary information for the main river.
.fld	Flood stages at each actual cross section.
.gz	Gage information at each gaging station.
.h	WSELs at each interpolated cross section at each computational time step.
.hs	Elevation corresponding to each top width (BS).
.loc	Location of each actual cross section.
.obs	Observed hydrographs at each gaging station.
.pk	Peak WSELs and discharges and their times at each cross section.
.q	Discharges at each interpolated cross section at each computational time step.
.tim	Computation time array.
.ttl	Description of data set and size of all necessary arrays
.us	Upstream boundary information for each river.
.x	Location of each interpolated cross section.

Prior to running FLDGRF, the following tasks must be done:

1. Log onto the anonymous ftp site: **ftp.nws.noaa.gov** and download fldgrf.Z (application) and fld.Z (script to run fldgrf) from the **/oh/rmechanics** location.
2. Add the following token to the **.Apps_defaults** file : **fldgrf_iface : $(HOME)/fldgrf** where **$(HOME)/fldgrf** is the location where the fldgrf files will be written by FLDWAV. Although the directory for the fldgrf files may be whatever the user chooses, it is recommended that it be placed in the users local directory to avoid overwriting of the files by multiple users. Make sure the directory exists and that the write mode is turned on (type **chmod +w *directory path***).
3. Store fldgrf.Z in the following directory: **/awips/hydroapps/rfc//fld/bin/RELEASE**. Note that **../fld/bin/RELEASE** must be created. Uncompress fldgrf.Z and make sure the executable mode is turned on (type **chmod +x fldgrf**).
4. Store fld.Z in the following directory: **/awips/hydroapps/rfc/nwsrfs/ofs/scripts**. Uncompress fld.Z and make sure the executable mode is turned on (type **chmod +x fld**).

FLDGRF is run by executing the following script: **fld -p fldgrf**. When executed, the FLDGRF program will display a menu bar as shown in Figure 1. The user must select the "***Select Dataset***" option from the **Control** menu. The program will read the information in the ".ttl" file and generate a list of rivers in the system. By default, FLDGRF will display information relating to the main river. The user may select the "***Select River***" option in the **Control** menu to display information in another river. The Plots menu shown in Figure 2 describes the available graphs which may be displayed. There are 11 displays available for each river in the data set. An example of each display is shown in Figures 3-16.

All of the displays have the option to show the data values except Option 5. The user may also get a close-up of a particular area by selecting the range to plot. Use the following steps to zoom in:

1. Select graph to be display from the **Plots** menu.
2. Select "***Show Data***" option in the **Control** menu of the plot.
3. Select the "***Select Point Range***" option in the **Control** menu of the data displayed
4. Tear-off the "***Select Point Range***" menu by clicking above the dashed line (Optional)
5. Select the "***Select First Point***" option in the "**Select Point Range**" menu.
6. Click on the first value in the table to be displayed
7. Select the "***Select Last Point***" option in the "**Select Point Range**" menu.
8. Click on the last value in the table to be displayed
9. Select the "***Display***" option in the "**Select Point Range**" menu.

Profiles at the peak conditions (WSEL and discharge) (Options 1 and 2) may be displayed for a specified reach of the river. The user may enter the range of data, and FLDGRF will display the peak condition for all interpolated cross sections in the specified range. Multiple "snapshots" in time of the river profile (Options 9 and 10) may also be displayed. The user may select specific

times to be displayed or select a time interval at which the profiles will be displayed.

Discharge and/or water surface elevation (WSEL) hydrographs (Options 3 and 4) may be displayed at any interpolated cross section with the peak condition noted. The peak condition and its time will be shown. If observed data are available, computed and observed hydrographs will be displayed along with statistical information (root-mean-square (RMS) error and standard deviation (BIAS)). Multiple discharge hydrographs at several locations along the river (Option 11) may be displayed on the same graph. The user may select specific points along the river to be displayed or select a distance interval at which the hydrographs will be displayed.

Cross sections (Option 5) may be displayed at the actual locations only (not interpolated sections). The maximum WSEL along with its corresponding topwidth, and the flood stage will be shown. In cases where the cross section has not been defined adequately to accommodate the maximum condition, the display will not show the ground above the maximum cross-section elevation.

Rating curves (Option 6) may be displayed at any interpolated cross section. The maximum WSEL and discharge will be shown.

The inflow hydrograph (Option 7) may be displayed. In most cases, this display will be the same one that is shown when selecting the upstream location for Options 3 or 4; however, if a dam is located at the upstream section, Option 3 will display the outflow from the dam, not the inflow hydrograph.

The downstream boundary (Option 8) may display either a hydrograph or rating curve as specified by FLDWAV. On tributaries, the downstream boundary will always be displayed as a WSEL hydrograph.

The velocity profile (Option 12) is currently unavailable.

COMPUTER REQUIREMENTS

This version of FLDGRF was written in C and is applicable on any Unix-based computer. Currently, FLDGRF has no printing capabilities. To obtain a hard copy of the graphs, the users must capture the screen and print using a program with a screen capturing capability.

ACKNOWLEDGEMENTS

The Unix version of FLDGRF was developed and tested by the late Hillel Sukenik. Because of Hillel's foresight, this version has been greatly improved over the original DOS version of FLDGRF.

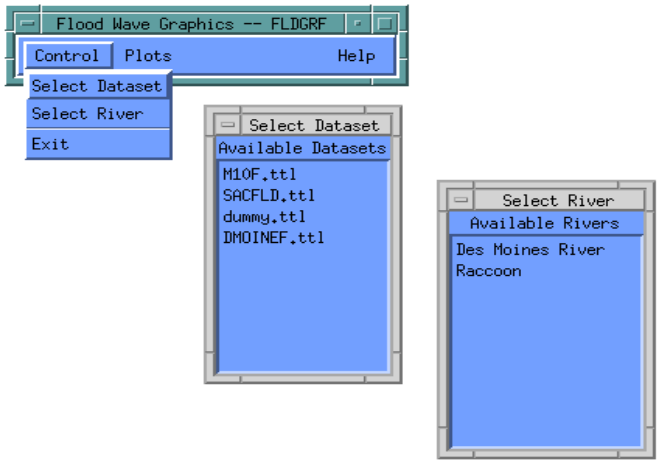

Figure 1 - FLDGRF Main Menu

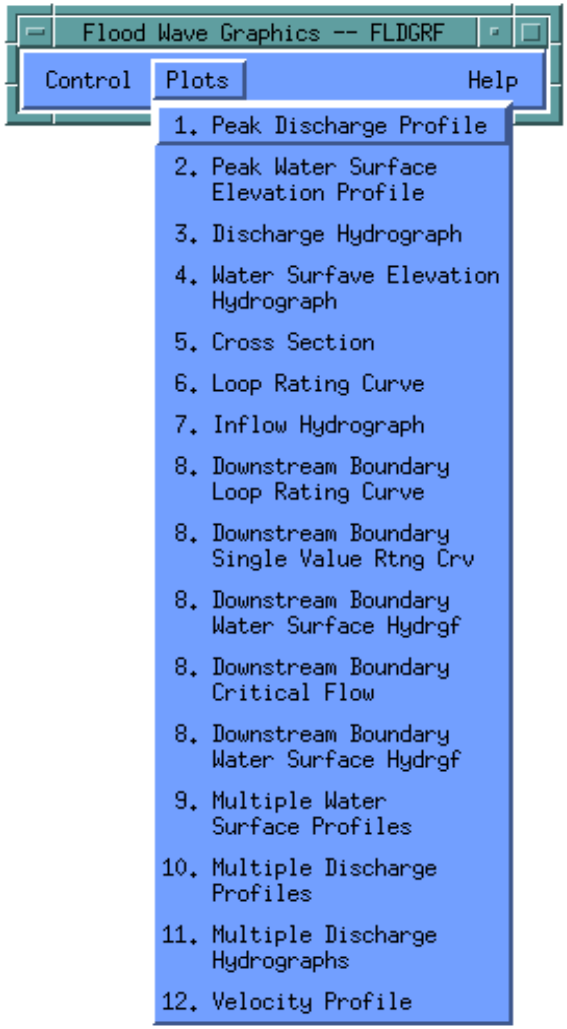

Figure 2 - FLDGRF Plot Options

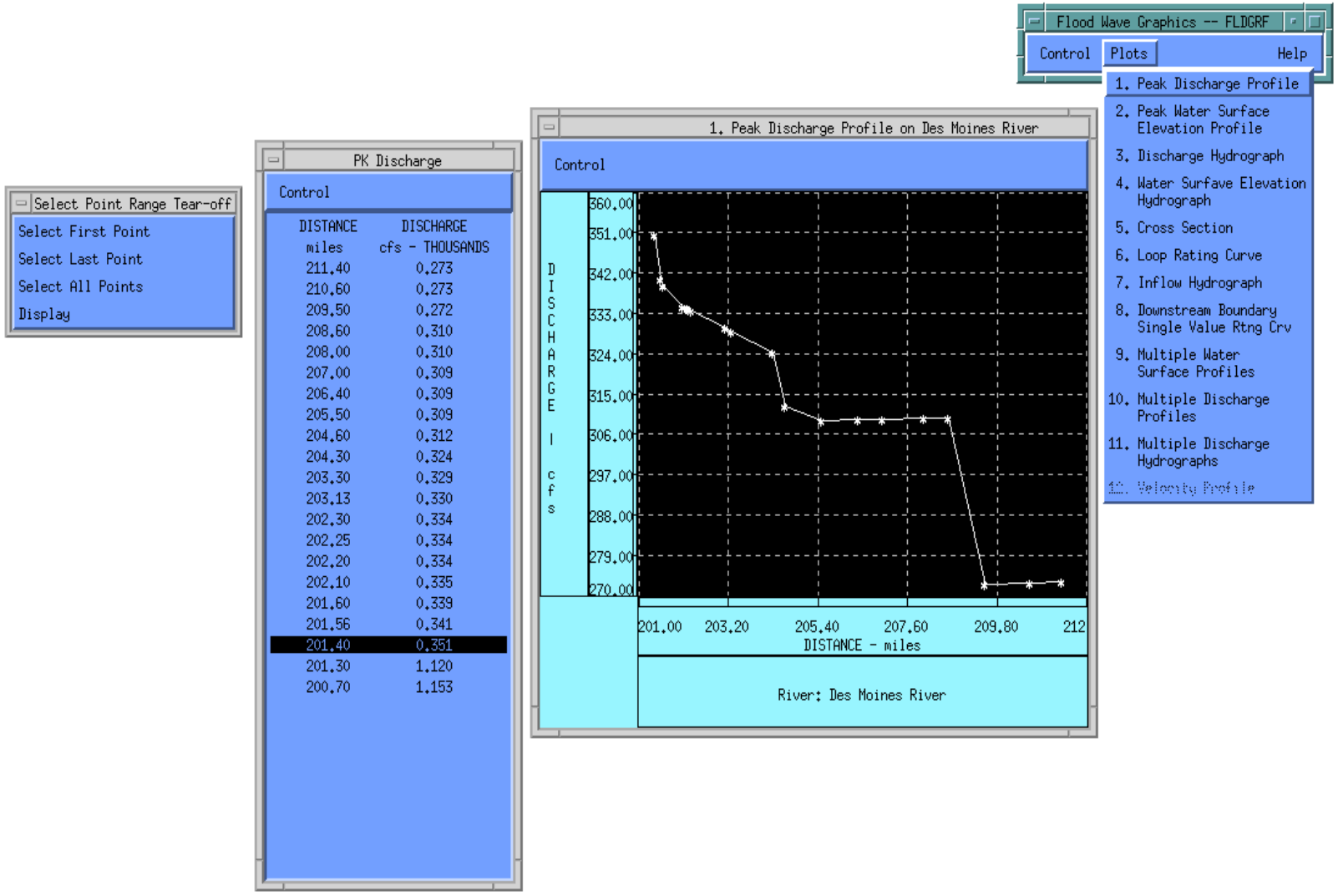

Figure 3 - Option 1 - Peak Discharge Profile Display

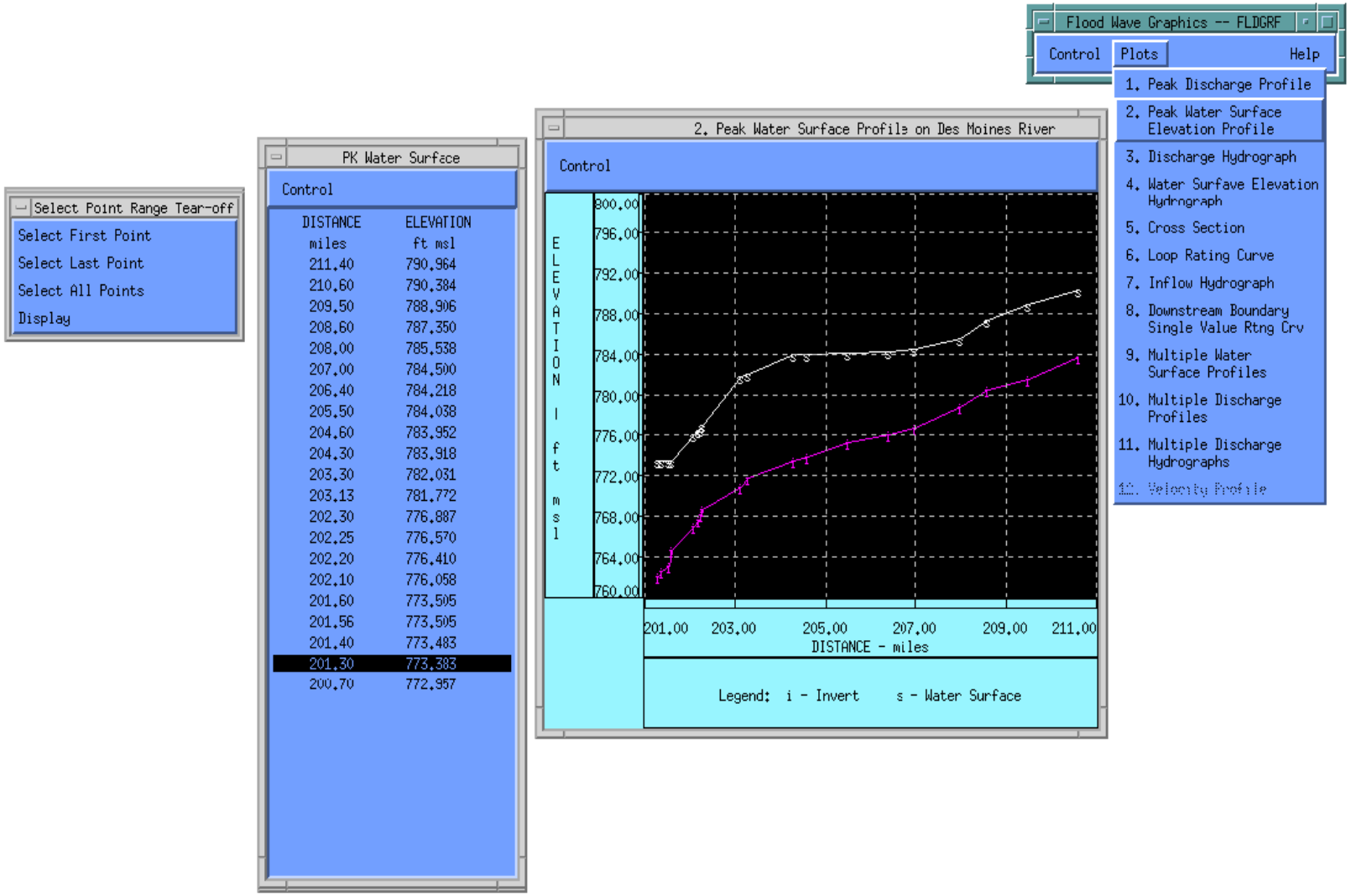

Figure 4 - Option 2 - Peak Water Surface Elevation Profile Display

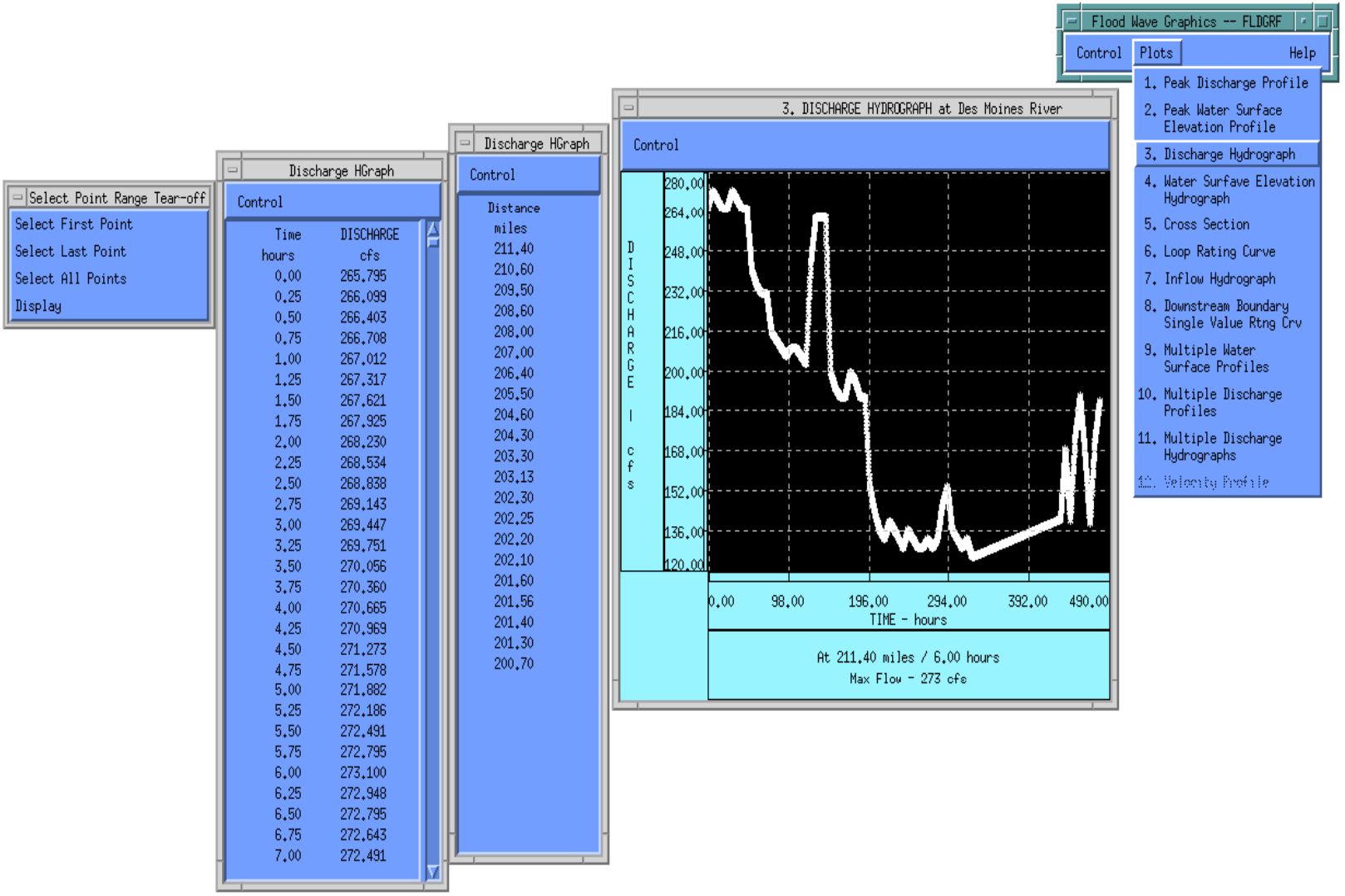

Figure 5 - Option 3 - Discharge Hydrograph Display

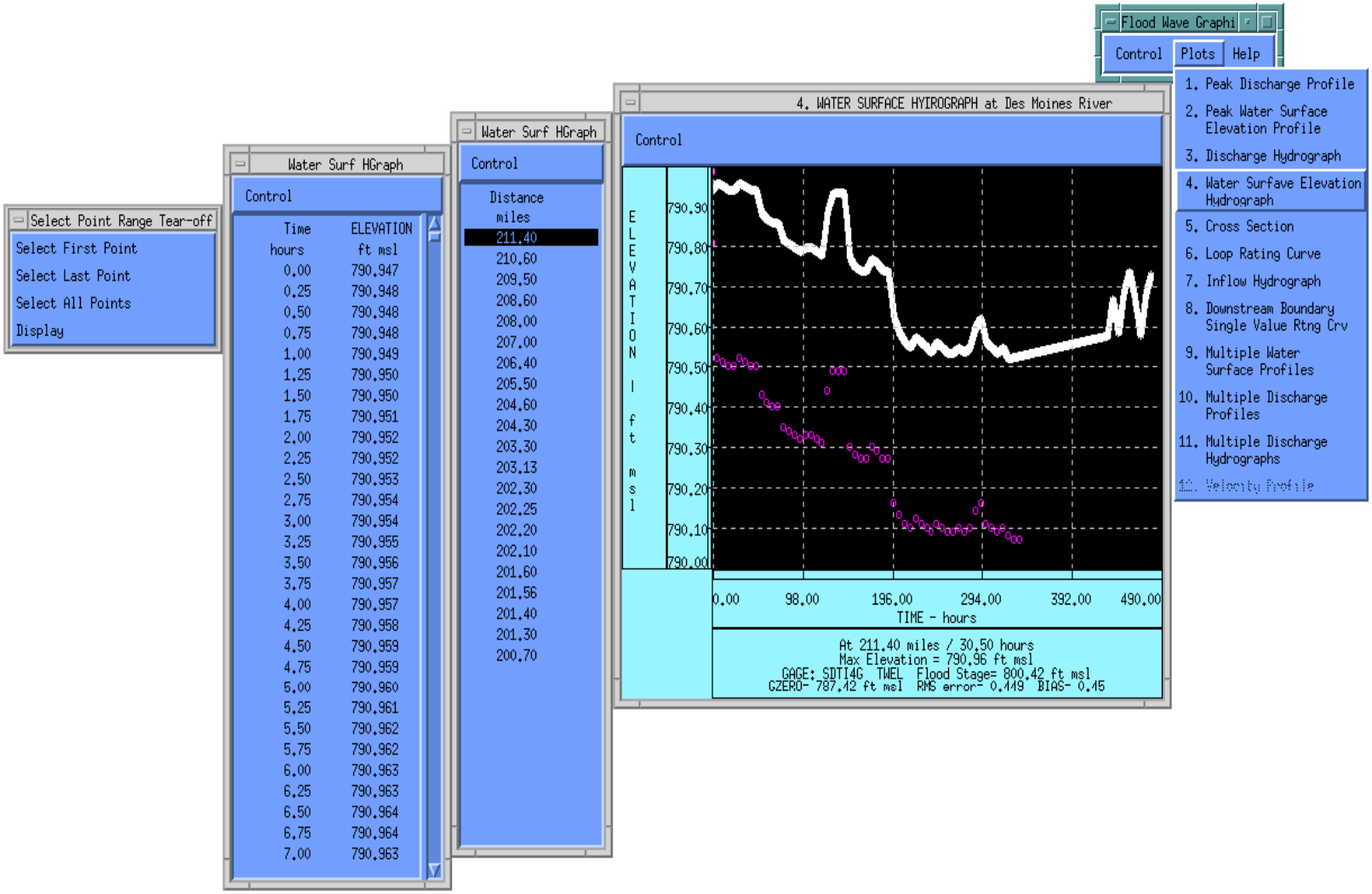

Figure 6 - Option 4 - Water Surface Elevation Hydrograph Display

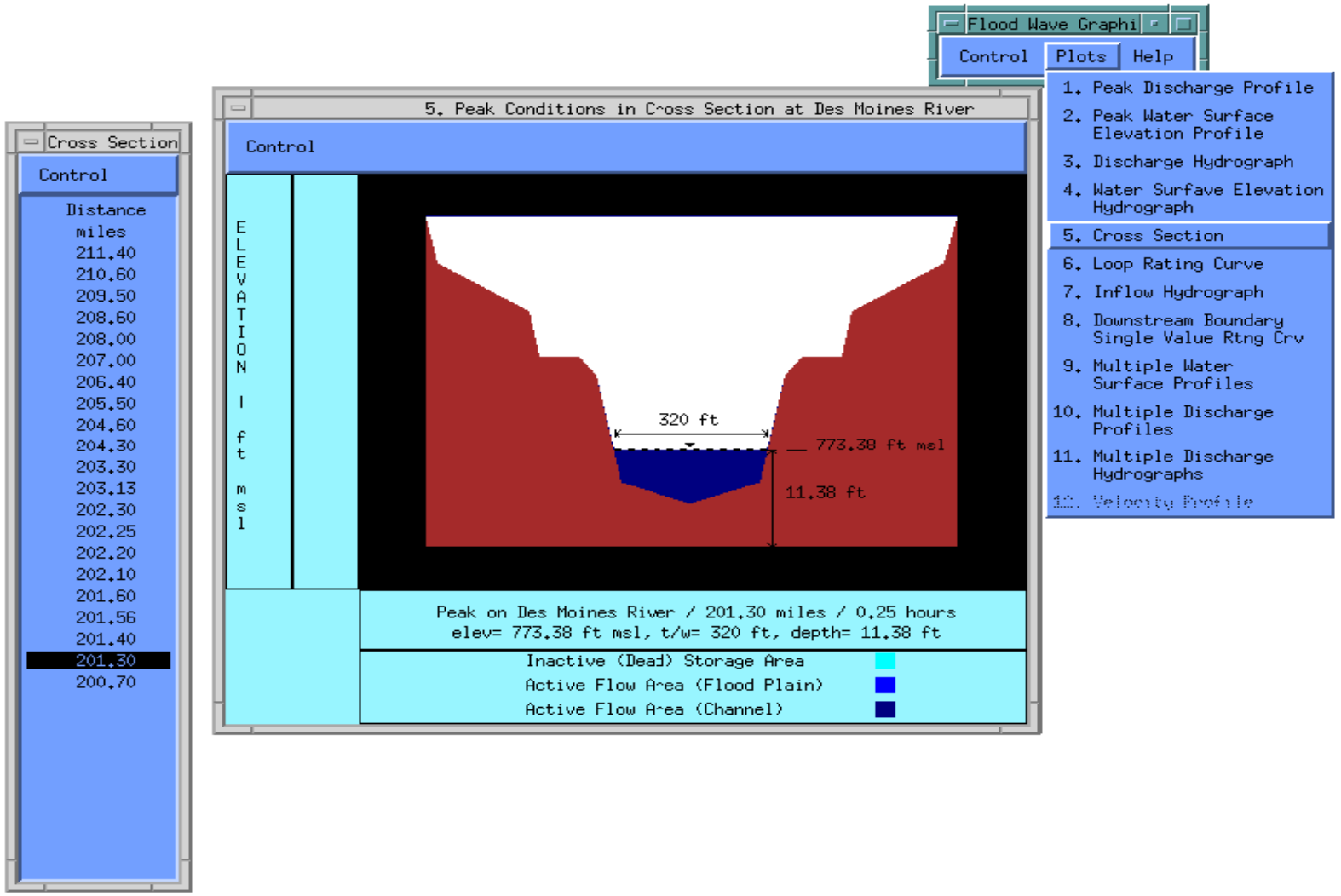

Figure 7 - Option 5 - Cross Section Display

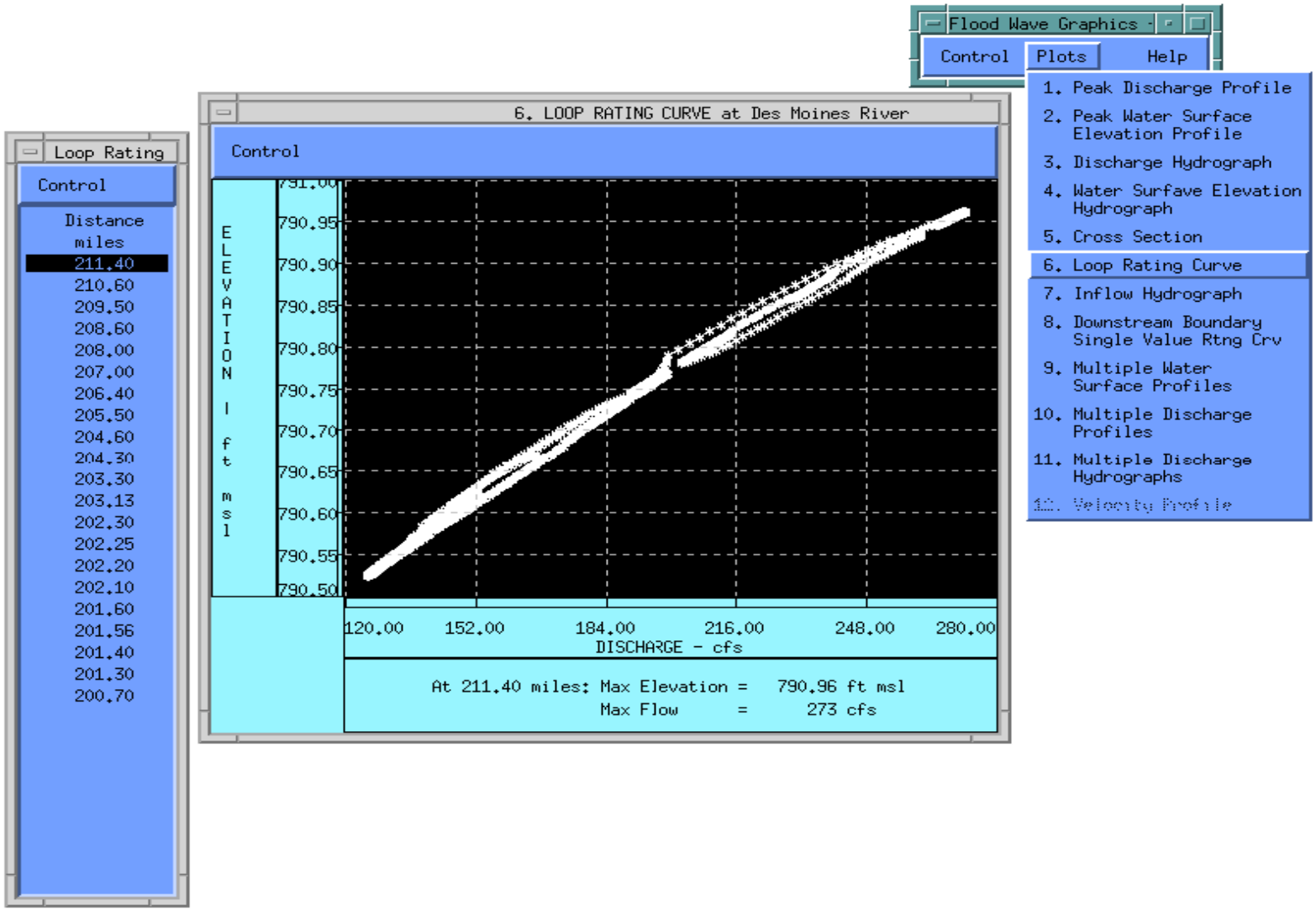

Figure 8 - Option 6 - Loop Rating Curve Display

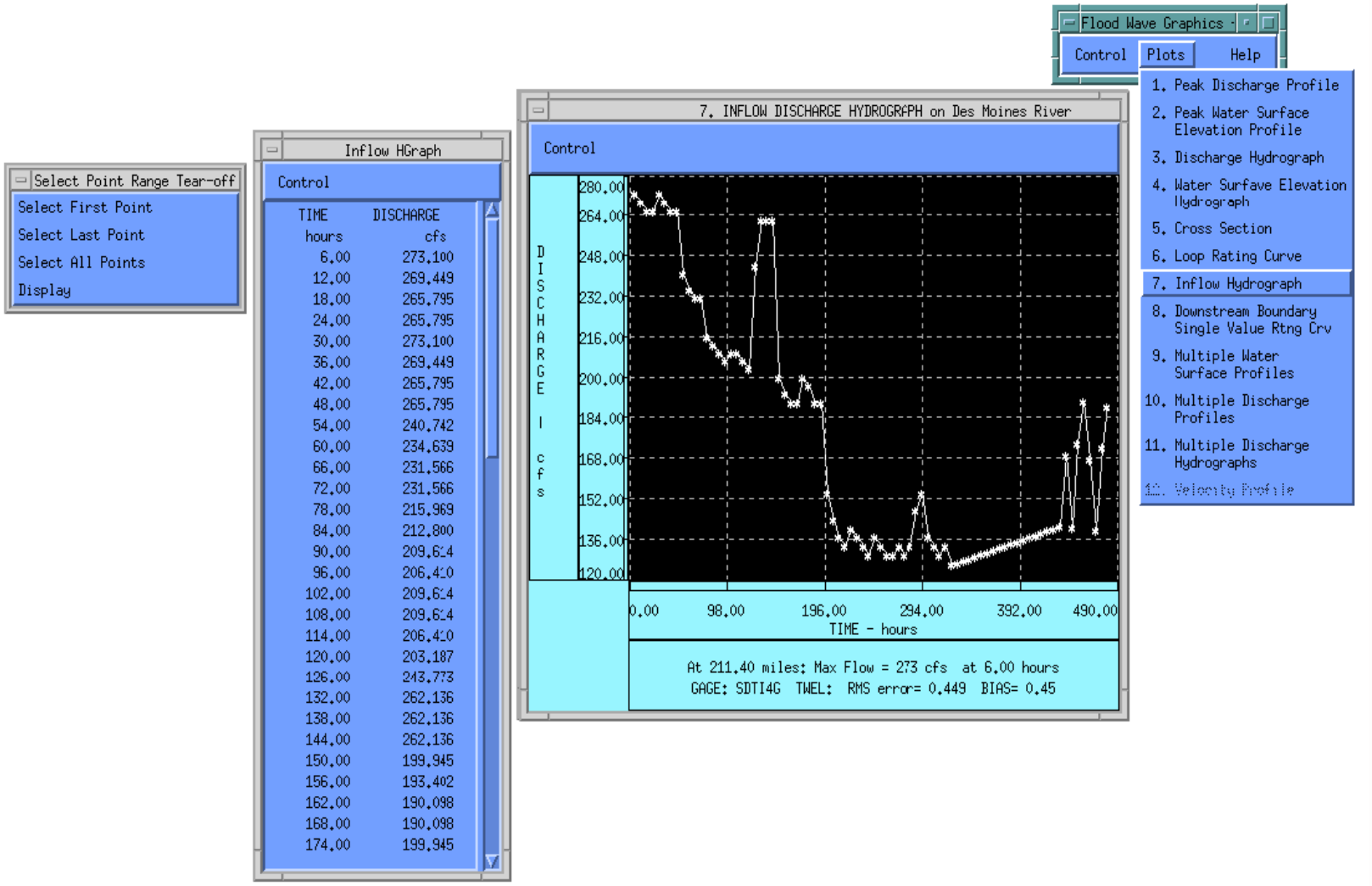

Figure 9 - Option 7 - Inflow Hydrograph

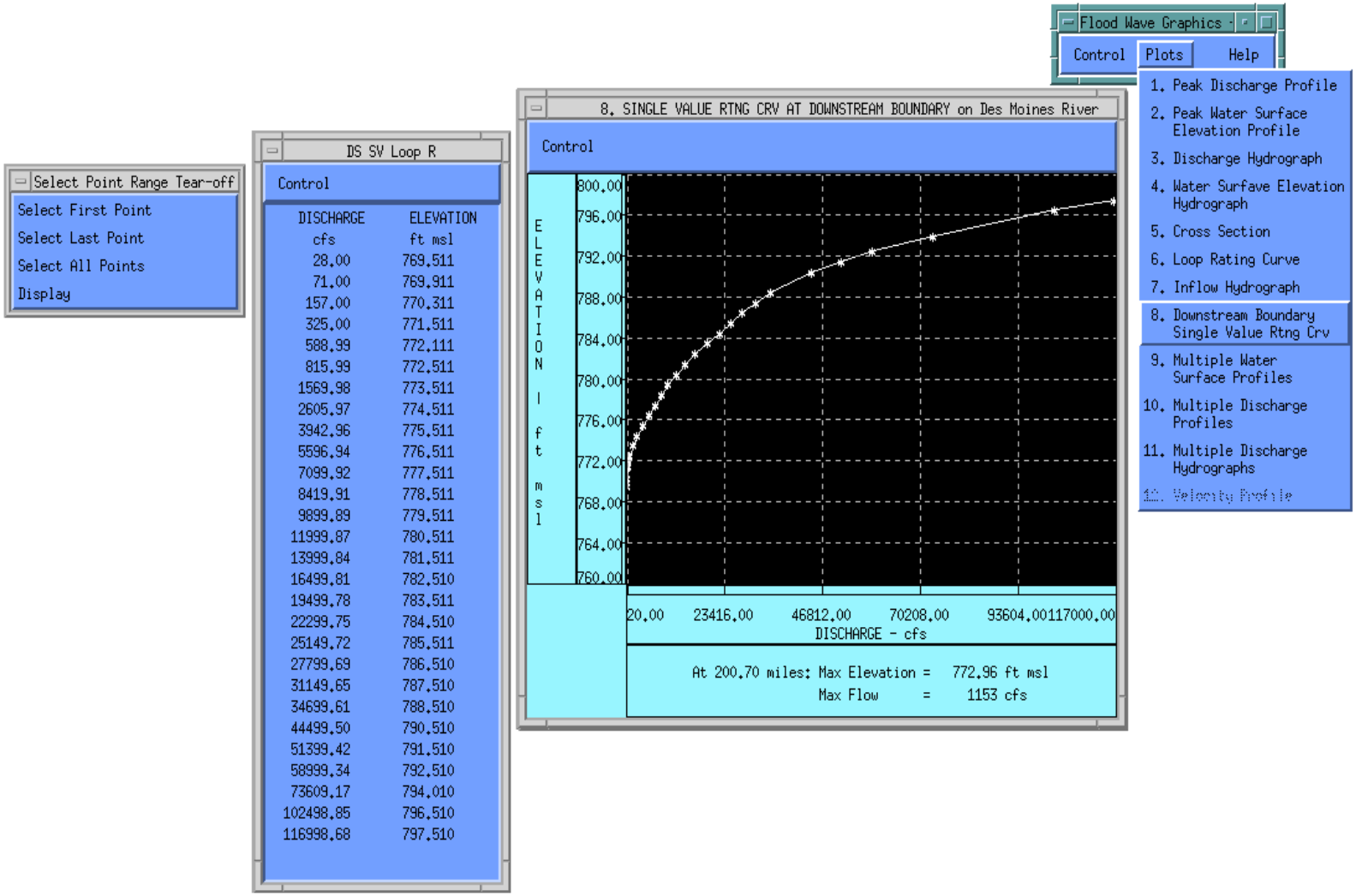

Figure 10 - Option 8 - Downstream Boundary Display

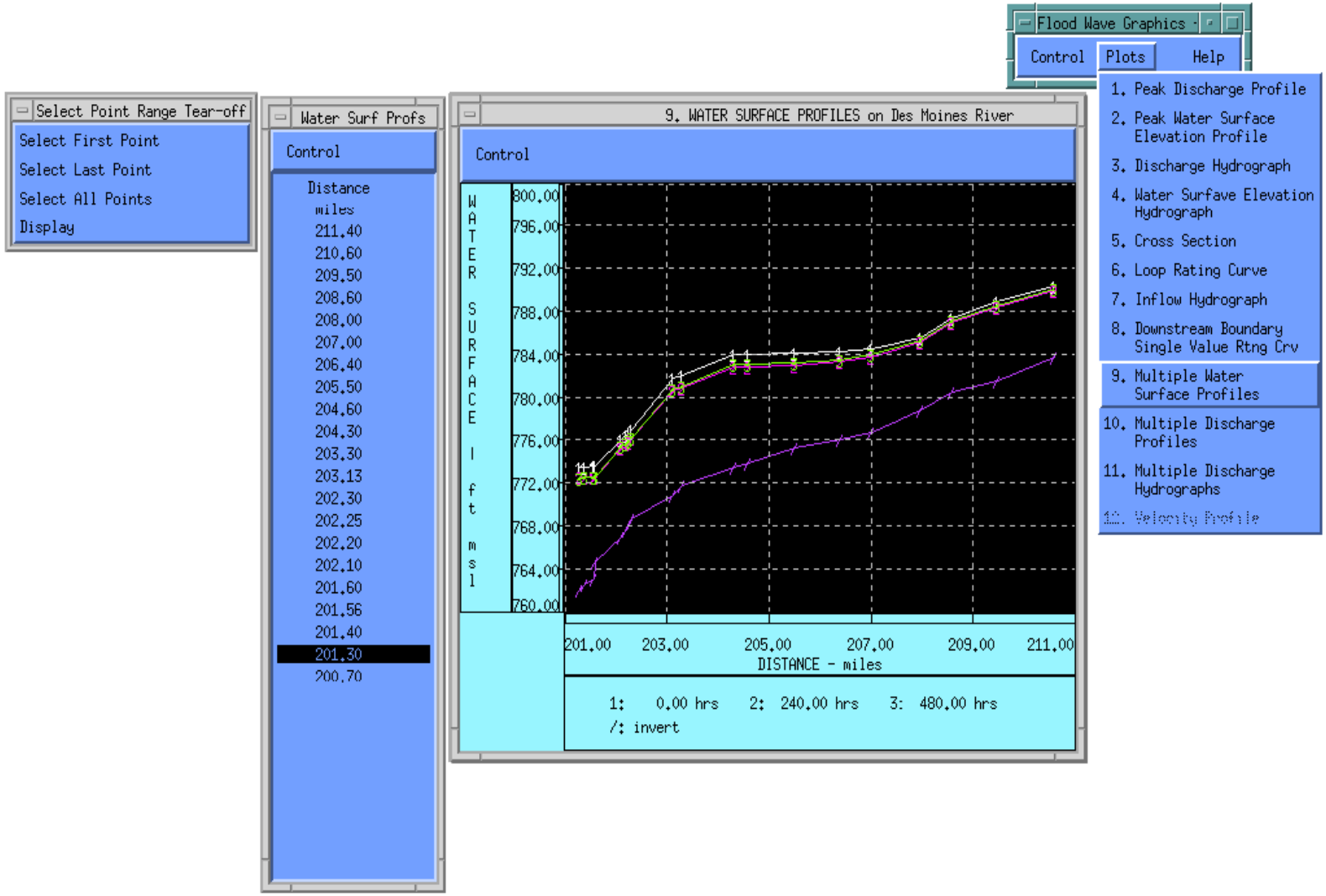

Figure 11 - Option 9 - Multiple Water Surface Profiles Display

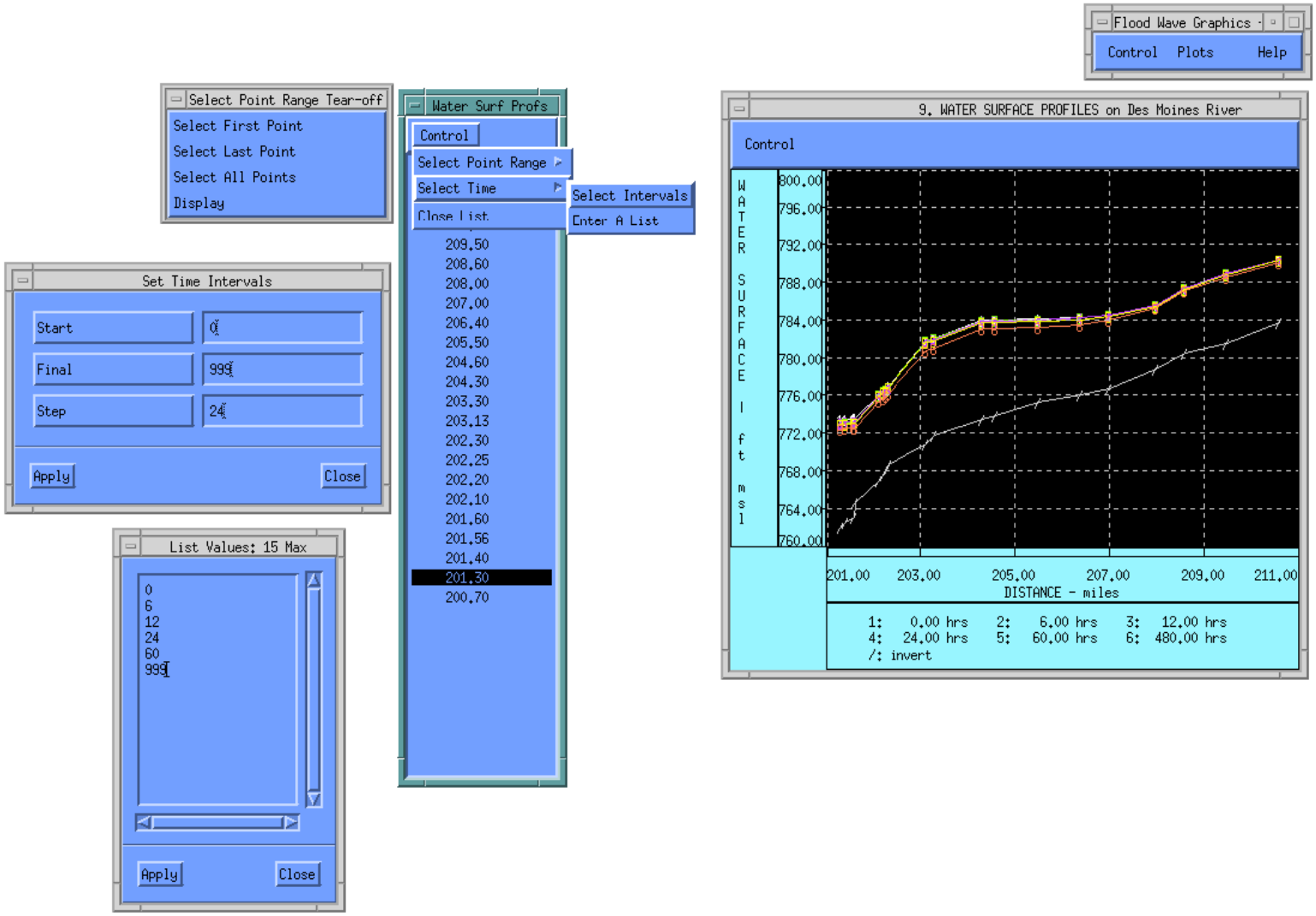

Figure 12 - Option 9 - Multiple Water Surface Profiles Display with Additional Menus Shown

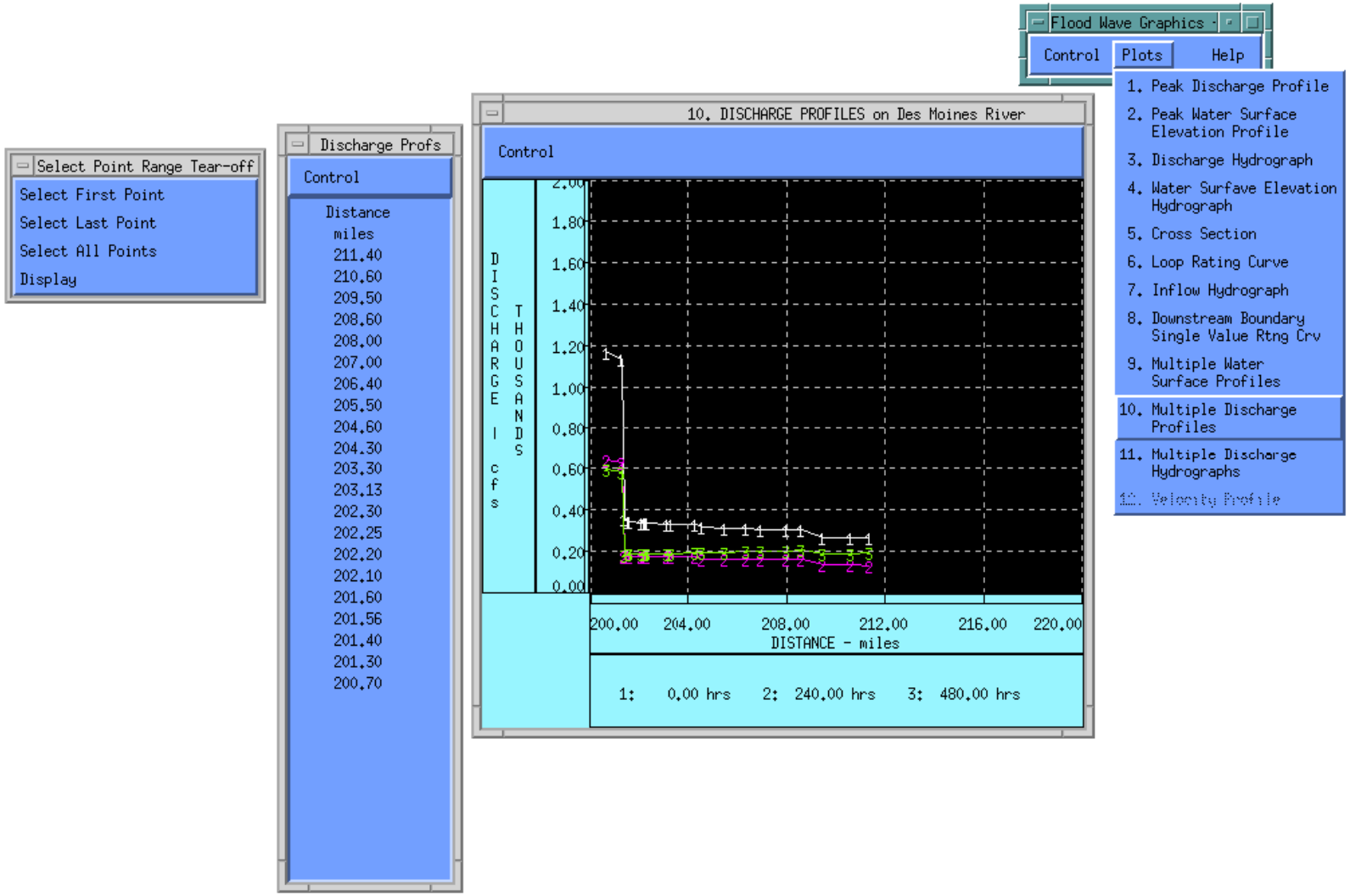

Figure 13 - Option 10 - Multiple Discharge Profiles Display

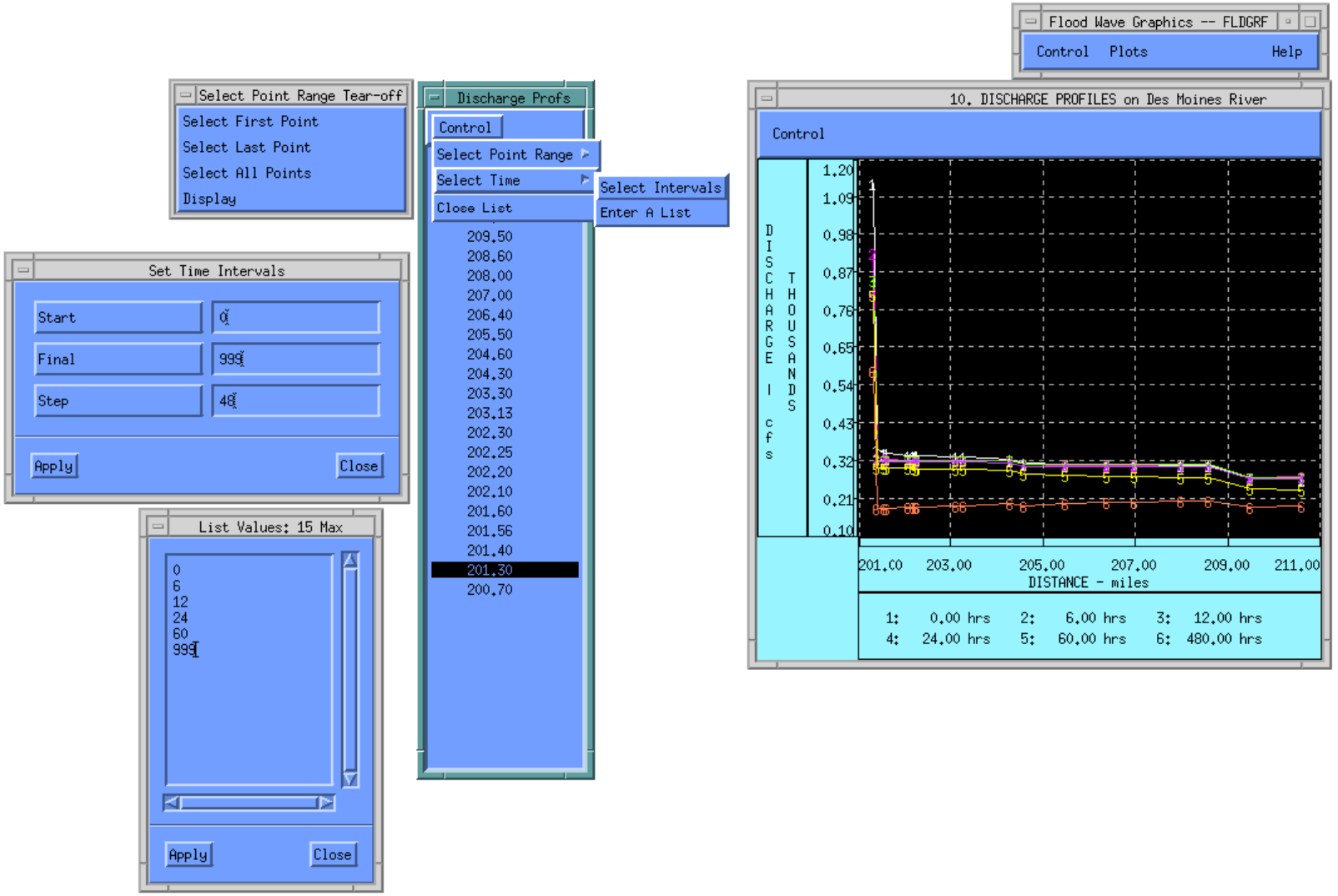

Figure 14 - Option 10 - Multiple Discharge Profiles Display with Additional Menus Shown

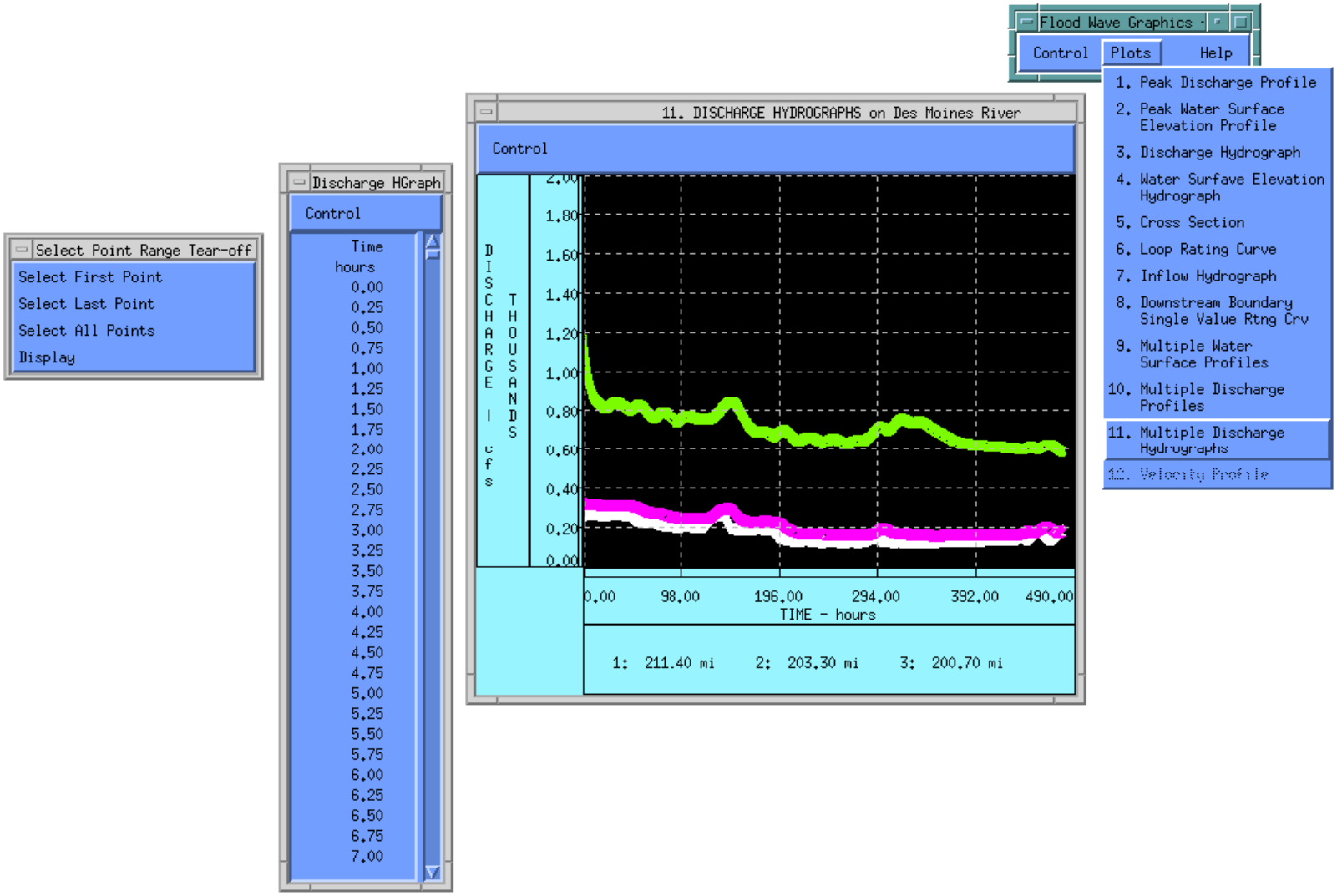

Figure 15 - Option 11 - Multiple Discharge Hydrtographs Display

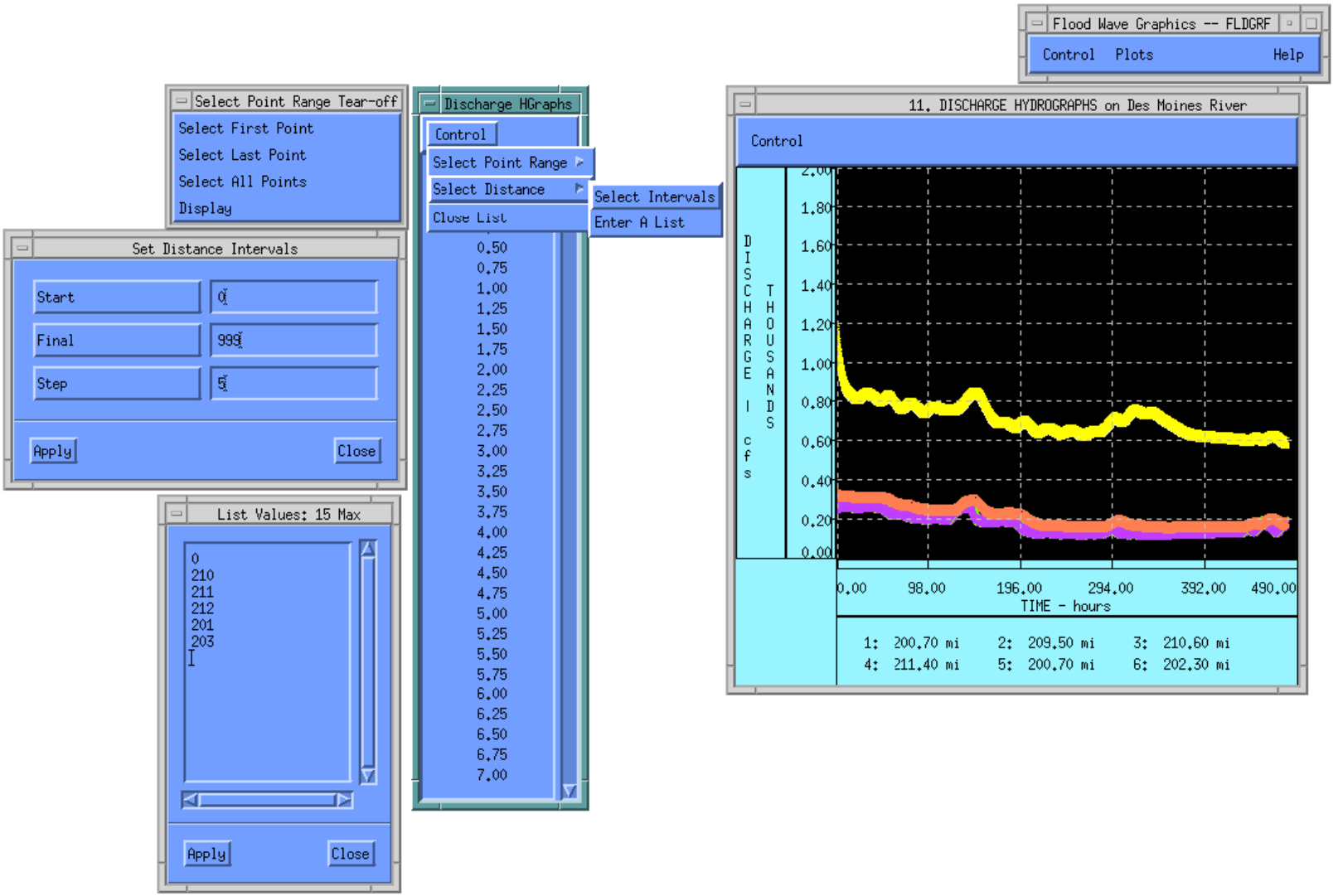

Figure 16 - Option 11 - Multiple Discharge Hydrographs Display with Additional Menus Shown